

Product Guide

	Series	Structure	Size Code in inch (in mm)	Inductance Range (H)										Rated Current (A)				
				0.1n	1n	10n	100n	1μ	10μ	100μ	1m	10m	10m	100m	1	10	100	
Inductors for Power Lines	LQM18FN_00 p141	Multilayer Type	0603 (1608)					1μH		10μH				50mA		150mA		
	LQM18PN_BO p52		0603 (1608)					1.5μH						600mA				
	LQM18PN_CO p53		0603 (1608)					470nH		2.2μH				700mA		850mA		
	LQM18PN_DO p55		0603 (1608)					2.5μH						700mA				
	LQM18PN_DH p56		0603 (1608)					2.2μH						650mA				
	LQM18PN_FO p58		0603 (1608)					1μH						600mA				
	LQM18PN_FH p59		0603 (1608)					470nH		2.2μH				700mA		1.4A		
	LQM18PN_FR p61		0603 (1608)					220nH		4.7μH				620mA		1.25A		
	LQM18PN_GH p63		0603 (1608)					1μH		3.3μH				1.05A				
	LQM18PW_CH p65		0603 (1608)					1μH		2.5μH				750mA		950mA		
	LQM21DN_00 p143		0805 (2012)					1μH		47μH				7mA		60mA		
	LQM21FN_00 p145		0805 (2012)					1μH		47μH				7mA		220mA		
	LQM21FN_70 p147		0805 (2012)					4.7μH		10μH				100mA		120mA		
	LQM21FN_80 p149		0805 (2012)					4.7μH		10μH				100mA		120mA		
	LQM21PN_CO p67		0805 (2012)					470nH		2.2μH				600mA		1.1A		
	LQM21PN_CA p69		0805 (2012)					2.2μH						1.05A				
	LQM21PN_CH p71		0805 (2012)					470nH		2.2μH				1.05A		1.6A		
	LQM21PN_EH p73		0805 (2012)					240nH		2.2μH				1.1A		2.8A		
	LQM21PN_GO p75		0805 (2012)					470nH		3.3μH				800mA		1.3A		
	LQM21PN_GC p77		0805 (2012)					1μH		2.2μH				800mA		900mA		
	LQM21PN_GH p79		0805 (2012)					470nH		4.7μH				1A		2.4A		
	LQM21PN_GR p81		0805 (2012)					1μH		4.7μH				800mA		1.3A		
	LQM21PN_GS p83		0805 (2012)					2.2μH		4.7μH				750mA		950mA		
	LQM2MPN_DH p102		0806 (2016)					2.2μH						1.27A				
	LQM2MPN_EH p104		0806 (2016)					240nH		2.2μH				1.1A		4.1A		
	LQM2MPN_GO p106		0806 (2016)					470nH		4.7μH				1.1A		1.6A		
	LQM2MPN_GH p108		0806 (2016)					160nH		2.2μH				1.3A		5A		
	LQM2HPN_CH p85		1008 (2520)					240nH		2.2μH				850mA		2.55A		
	LQM2HPN_EO p87		1008 (2520)					560nH						1.5A				
	LQM2HPN_EH p88		1008 (2520)					240nH		2.2μH				1.3A		4.5A		
	LQM2HPN_GO p90		1008 (2520)					470nH		4.7μH				1.1A		1.8A		
	LQM2HPN_GC p92		1008 (2520)					1μH		4.7μH				800mA		1.5A		
	LQM2HPN_GH p94		1008 (2520)					240nH		2.2μH				1.5A		5A		
	LQM2HPN_GS p96		1008 (2520)					2.2μH		4.7μH				1A		1.1A		
	LQM2HPN_JO p98		1008 (2520)					1μH		3.3μH				1A		1.5A		
	LQM2HPN_JH p100		1008 (2520)					470nH		2.2μH				1.5A		3.2A		
	LQM31PN_00 p110		1206 (3216)					470nH		4.7μH				700mA		1.4A		
	LQM32PN_GO p112		1210 (3225)					1μH						1.8A				
	LQM32PN_GC p113		1210 (3225)					1μH						2.2A				
	LQW15CN_00 p115	Wire Wound Ferrite Core Type	0402 (1005)				18nH		200nH					390mA		1.4A		
	LQW15CN_10 p117		0402 (1005)				20nH		3.3μH					130mA		2.2A		
	LQW18CN_00 p119		0603 (1608)				4.9nH		650nH					430mA		2.6A		
	LQH2MCN_02 p14		0806 (2016)				1μH		82μH					90mA		485mA		
LQH2MCN_52 p16	0806 (2016)					1μH		22μH					130mA		595mA			
LQH2MPN_GR p18	0806 (2016)					330nH		82μH					210mA		2.2A			
LQH2HPN_GR p10	1008 (2520)					470nH		100μH					210mA		2.9A			
LQH2HPN_JR p12	1008 (2520)					470nH		22μH					540mA		3.5A			
DEM2812C p388	1211 (3028)					470nH		12μH					760mA		3.1A			
DEM2815C p389	1211 (3028)					470nH		15μH					800mA		3.9A			
DEM2818C p390	1211 (3028)					470nH		12μH					1A		4.7A			
LQH3NPN_GR p28	1212 (3030)					470nH		250μH					140mA		2.82A			
LQH3NPN_JR p30	1212 (3030)					680nH		47μH					570mA		2.86A			
LQH3NPN_ME p32	1212 (3030)					1μH		100μH					430mA		3A			

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● Part Numbering

Inductors for Power Lines

(Part Number)

LQ	M	21	P	N	R54	M	G	0	D
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

① Product ID

Product ID	
LQ	Chip Inductors (Chip Coils)

② Structure

Code	Structure
H	Wire Wound Type (Ferrite Core)
W	
M	Multilayer Type (Ferrite Core)

③ Dimensions (LxW)

Code	Nominal Dimensions (LxW)	Size Code (in inch)
15	1.0x0.5mm	0402
18	1.6x0.8mm	0603
21	2.0x1.25mm	0805
2M	2.0x1.6mm	0806
2H	2.5x2.0mm	1008
3N	3.0x3.0mm	1212
31	3.2x1.6mm	1206
32	3.2x2.5mm	1210
43	4.5x3.2mm	1812
44	4.0x4.0mm	1515
5B	5.0x5.0mm	2020
55	5.7x5.0mm	2220
66	6.3x6.3mm	2525

④ Applications and Characteristics

Code	Series	Applications and Characteristics
D	LQM	for Choke (Low-current DC Power Supplies)
F		for Choke (DC Power Supplies)
D	LQH	for Choke
S		for Choke (Magnetically Shielded Type)
C	LQH/LQW	for Choke (Coating Type)
P	LQM/LQH	for Power Line

⑤ Category

Code	Category
N	Standard Type
B	Special Feature Classification
W	

⑥ Inductance

Expressed by three-digit alphanumerics. The unit is micro-henry (μH). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two figures. If there is a decimal point, it is expressed by the capital letter "R." In this case, all figures are significant digits. If inductance is less than $0.1\mu\text{H}$, the inductance code is expressed by a combination of two figures and the capital letter "N," and the unit of inductance is nano-henry (nH). The capital letter "N" indicates the unit of "nH," and also expresses a decimal point. In this case, all figures are significant digits. For those products whose inductance values are specified using three designated digits, these values may be indicated using the closest two digits instead.

⑦ Inductance Tolerance

Code	Inductance Tolerance
D	$\pm 0.5\text{nH}$
J	$\pm 5\%$
K	$\pm 10\%$
M	$\pm 20\%$
N	$\pm 30\%$

⑧ Features (Except for LQH□□P/LQM□□P)

Code	Features	Series
0	Standard Type	LQM/LQH*1 /LQW
1	Low DC Resistance	LQW
2	Standard Type	LQH32C/32D
3	Low DC Resistance	LQH32C/43CN
5	Low Profile Type	LQH2MC/32C/32D
7	Large Current Type	LQM21F
8	Low DC Resistance /Large Current Type	

*1 Except for LQH32 Series

⑨ Thickness

(LQH□□P/LQM□□P Only • Except for LQH43P/LQH5BPN_38)

Code	Nominal Dimensions (T)
B	0.35mm
C	0.5mm
D	0.6mm
E	0.7mm
F	0.8mm
O	0.85mm
G	0.9mm
J	1.1mm
M	1.4mm
N	1.55mm
P	1.65mm
T	2.0mm

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⑨ Electrode (Except for LQH□□P/LQM□□P)

•Lead (Pb) Free

Code	Electrode	Series
0	Sn	LQM/LQW
2		LQH2MC
3	LF Solder	LQH (Except for LQH2MC)

⑨ Specification

(LQH□□P/LQM□□P Only • Except for LQH43P/LQH5BPN_38)

Code	Specification
0/S	Standard Type
C	Good Bias Current Characteristics Type
H/A/E	High Spec Type (Low DC Resistance; Good Bias Current Characteristics Type)
R	Low DC Resistance Type

⑧⑨ Thickness (LQH43P/LQH5BPN_38 Only)

Code	Dimensions (T)
26	2.6mm
38	4.0mm max.

⑩ Packaging

Code	Packaging	Series
K	Embossed Taping (ø330mm Reel)	LQH* ¹ /LQM21* ²
F		LQH3NP_MR
L	Embossed Taping (ø180mm Reel)	LQH* ⁵ /LQM18P/LQM21* ² /LQM31P/LQM32P/LQM2HP/LQM2MP
E		LQH3NP_MR
B	Bulk	LQH2MC/LQM/LQW
J	Paper Taping (ø330mm Reel)	LQM18/LQM21* ³
D	Paper Taping (ø180mm Reel)	LQM18/LQM21* ⁴ /LQW

*1 Except for LQH2MC/LQH2HP_G0/LQH3NP/LQH43C

*2 LQM21D(22 - 47μH)/LQM21F(4.7 - 47μH)

*3 LQM21D(1.0 - 10μH)/LQM21F(1.0 - 2.2μH)

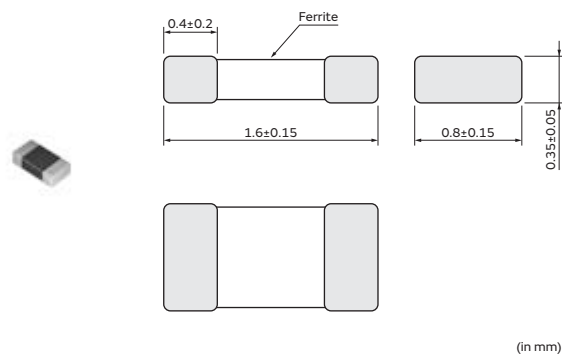
*4 LQM21D(1.0 - 10μH)/LQM21F(1.0 - 2.2μH)/LQM21P

*5 Except for LQH3NP_MR

Inductors for Power Lines

LQM18PN_B0 Series 0603 (1608) inch (mm)

Appearance/Dimensions



Packaging

Code	Packaging	Minimum Quantity
L	ø180mm Embossed Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

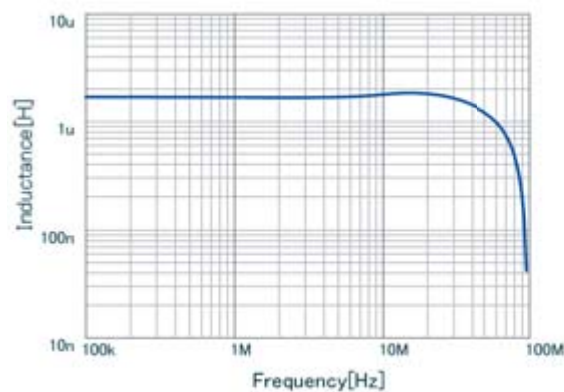
Part Number	Inductance	Inductance Test Frequency	Rated Current	DC Resistance	S.R.F.* (min.)
LQM18PN1R5NB0□	1.5μH ±30%	1MHz	600mA	0.35Ω±25%	50MHz

Operating temp. range: -55 to 125°C

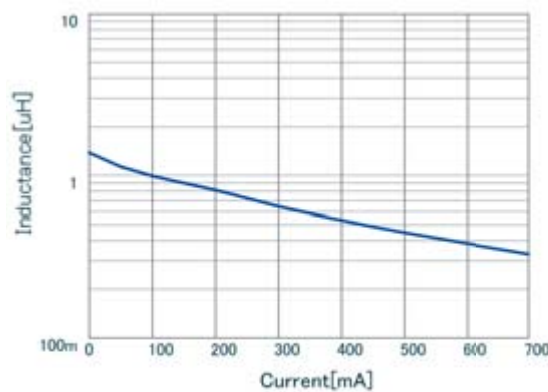
Class of Magnetic Shield: Ferrite Core

*S.R.F.: Self-Resonant Frequency

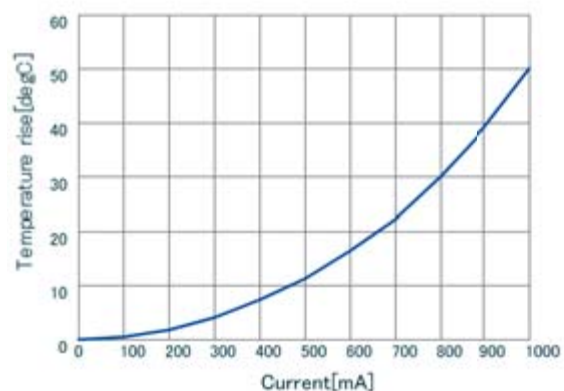
Inductance-Frequency Characteristics (Typ.)



Inductance-Current Characteristics (Typ.)



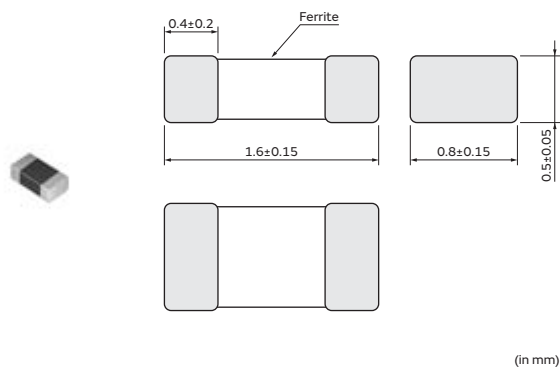
Temperature Rise Characteristics (Typ.)



Inductors for Power Lines

LQM18PN_C0 Series 0603 (1608) inch (mm)

Appearance/Dimensions



Packaging

Code	Packaging	Minimum Quantity
L	ø180mm Embossed Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

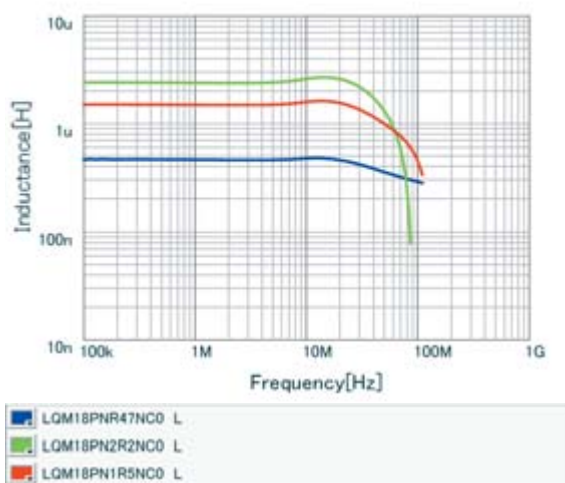
Part Number	Inductance	Inductance Test Frequency	Rated Current	DC Resistance	S.R.F.* (min.)
LQM18PNR47NC0□	0.47μH ±30%	1MHz	850mA	0.15Ω±25%	50MHz
LQM18PN1R0NC0□	1.0μH ±30%	1MHz	750mA	0.20Ω±25%	50MHz
LQM18PN1R5NC0□	1.5μH ±30%	1MHz	720mA	0.22Ω±25%	50MHz
LQM18PN1R8NC0□	1.8μH ±30%	1MHz	700mA	0.24Ω±25%	50MHz
LQM18PN2R2NC0□	2.2μH ±30%	1MHz	700mA	0.24Ω±25%	50MHz

Operating temp. range: -55 to 125°C

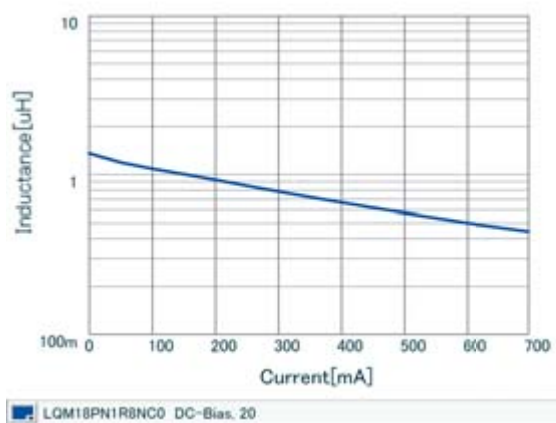
Class of Magnetic Shield: Ferrite Core

*S.R.F.: Self-Resonant Frequency

Inductance-Frequency Characteristics (Typ.)



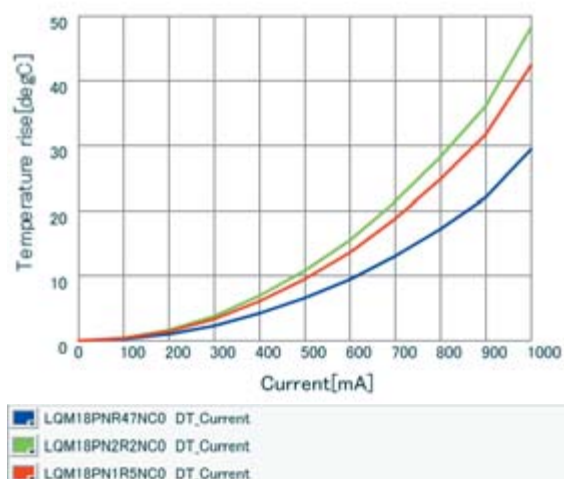
Inductance-Current Characteristics (Typ.)



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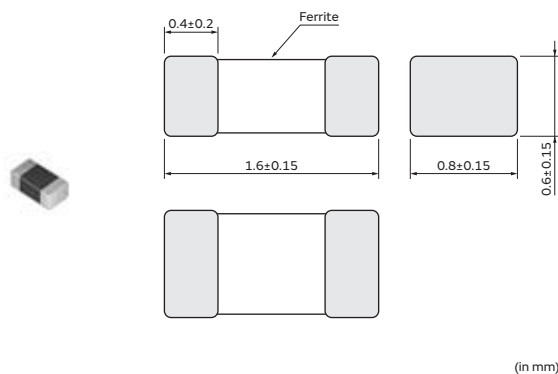
Temperature Rise Characteristics (Typ.)



Inductors for Power Lines

LQM18PN_D0 Series 0603 (1608) inch (mm)

Appearance/Dimensions



Packaging

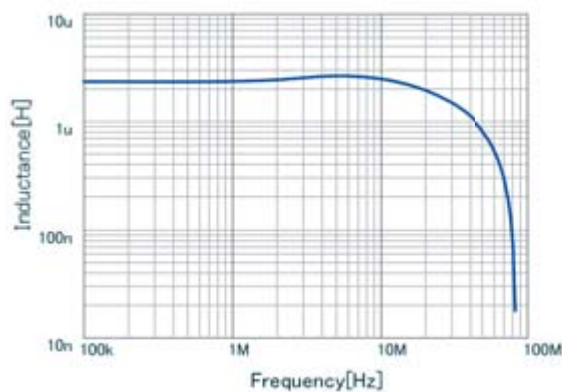
Code	Packaging	Minimum Quantity
D	ø180mm Paper Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

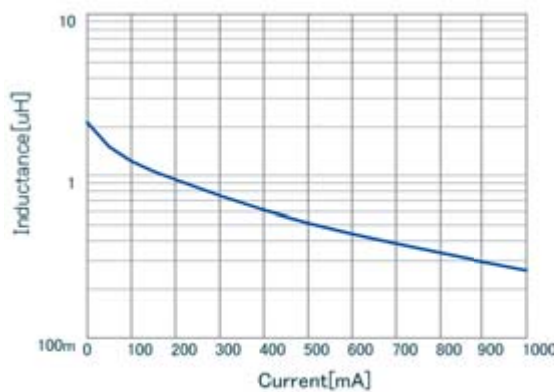
Part Number	Inductance	Inductance Test Frequency	Rated Current	DC Resistance	S.R.F.* (min.)
LQM18PN2R5ND0□	2.5μH ±30%	1MHz	700mA	0.24Ω±25%	60MHz

Operating temp. range: -40 to 85°C
Class of Magnetic Shield: Ferrite Core
*S.R.F.: Self-Resonant Frequency

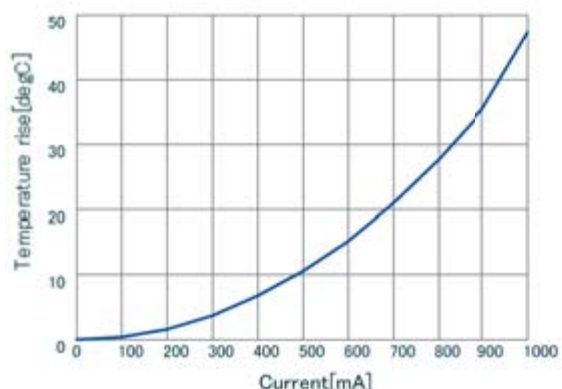
Inductance-Frequency Characteristics (Typ.)



Inductance-Current Characteristics (Typ.)



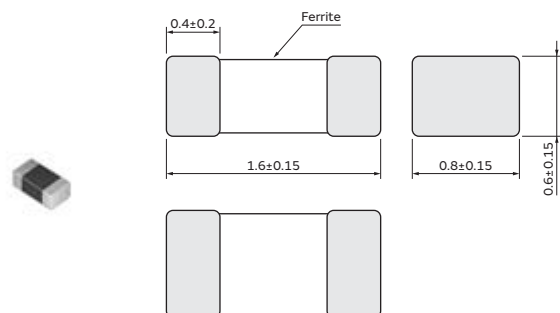
Temperature Rise Characteristics (Typ.)



Inductors for Power Lines

LQM18PN_DH Series 0603 (1608) inch (mm)

Appearance/Dimensions



(in mm)

Packaging

Code	Packaging	Minimum Quantity
D	ø180mm Paper Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

Part Number	Inductance	Inductance Test Frequency	Rated Current (Isat)*	Rated Current (Itemp)*	DC Resistance	S.R.F.* (min.)
LQM18PN2R2MDH□	2.2μH ±20%	1MHz	250mA(Max) / 300mA(Typ.)	650mA(Max) / 800mA(Typ.)	0.38Ω(typ.)	60MHz

Operating temp. range: -40 to 85°C

Class of Magnetic Shield: Ferrite Core

For reflow soldering only

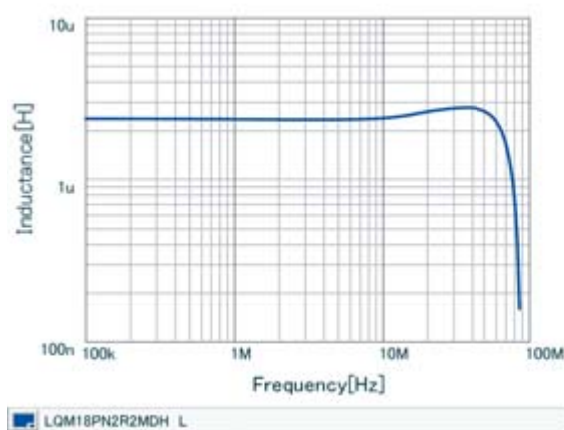
*Isat: Rated Current based on Inductance change

*Itemp: Rated Current based on Temperature rise

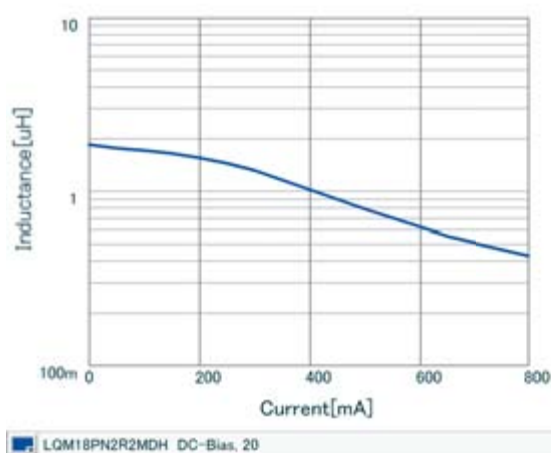
*S.R.F.: Self-Resonant Frequency

When rated current is applied to the products, inductance will be within ±30% of initial inductance value range. When rated current is applied to the products, the temperature rise caused by self-generated heat shall be limited to 40°C max. Keep the temperature (ambient temperature plus self-generation of heat) under 125°C.

Inductance-Frequency Characteristics (Typ.)



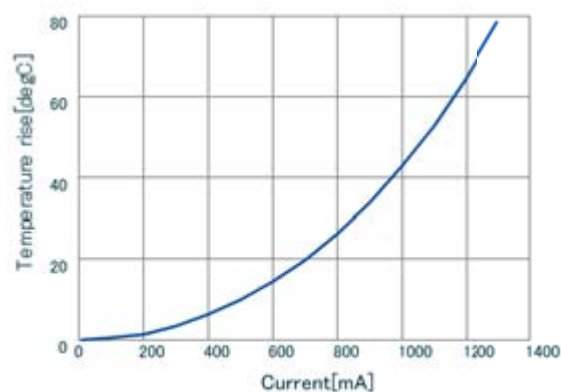
Inductance-Current Characteristics (Typ.)



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Temperature Rise Characteristics (Typ.)

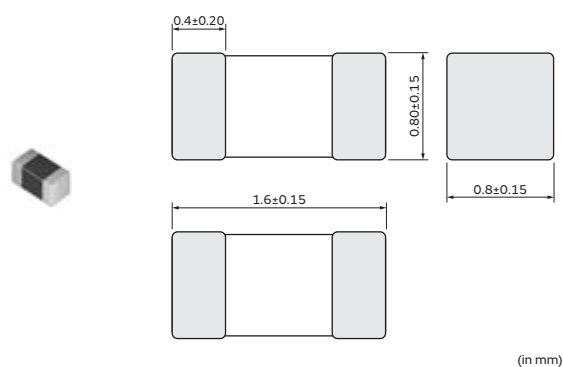


LQM18PN2R2MDH DT_Current

Inductors for Power Lines

LQM18PN_F0 Series 0603 (1608) inch (mm)

Appearance/Dimensions



Packaging

Code	Packaging	Minimum Quantity
L	ø180mm Embossed Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

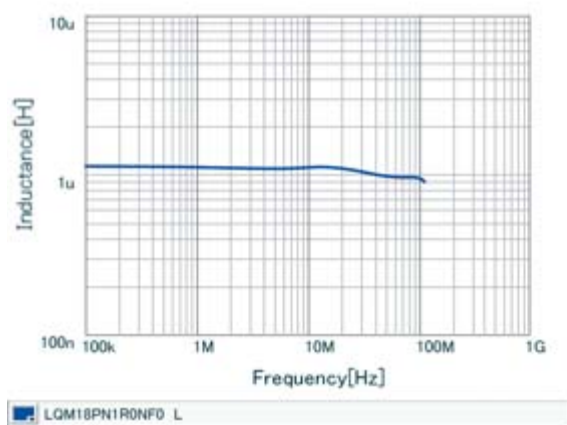
Part Number	Inductance	Inductance Test Frequency	Rated Current	DC Resistance	S.R.F.* (min.)
LQM18PN1R0NF0□	1.0μH ±30%	1MHz	600mA	0.28Ω±25%	50MHz

Operating temp. range: -55 to 125°C

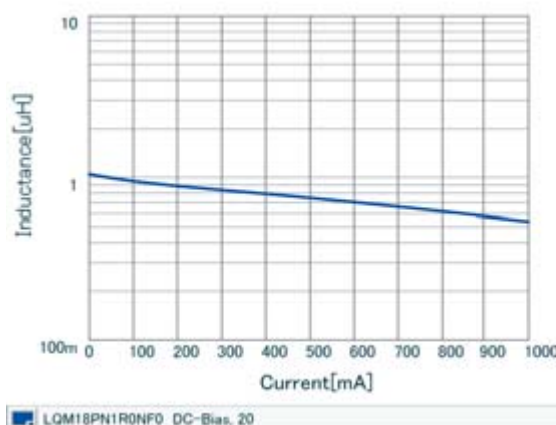
Class of Magnetic Shield: Ferrite Core

*S.R.F.: Self-Resonant Frequency

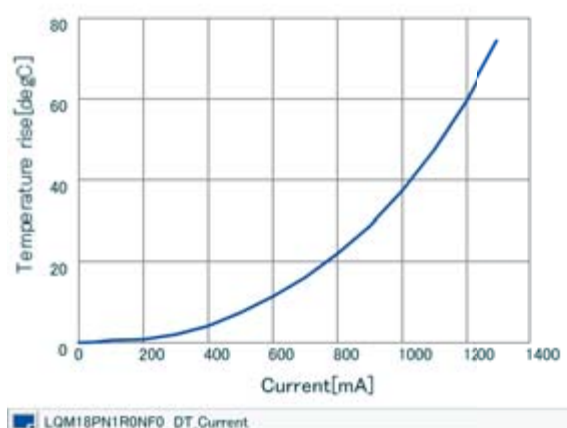
Inductance-Frequency Characteristics (Typ.)



Inductance-Current Characteristics (Typ.)



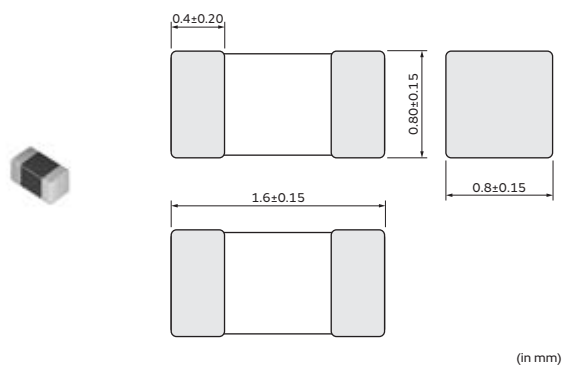
Temperature Rise Characteristics (Typ.)



Inductors for Power Lines

LQM18PN_FH Series 0603 (1608) inch (mm)

Appearance/Dimensions



Packaging

Code	Packaging	Minimum Quantity
D	ø180mm Paper Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

Part Number	Inductance	Inductance Test Frequency	Rated Current (Isat)*	Rated Current (Itemp)*	DC Resistance	S.R.F.* (min.)
LQM18PNR47MFH□	0.47μH ±20%	1MHz	1.3A(Max.) / 1.5A(Typ.)	1.4A(Max.) / 1.7A(Typ.)	0.1Ω(typ.)	100MHz
LQM18PN1R0MFH□	1.0μH ±20%	1MHz	0.55A(Max.) / 0.7A(Typ.)	1.3A(Max.) / 1.45A(Typ.)	0.13Ω(typ.)	100MHz
LQM18PN1R5MFH□	1.5μH ±20%	1MHz	0.4A(Max.) / 0.5A(Typ.)	1.1A(Max.) / 1.25A(Typ.)	0.17Ω(typ.)	80MHz
LQM18PN2R2MFH□	2.2μH ±20%	1MHz	0.3A(Max.) / 0.35A(Typ.)	0.7A(Max.) / 0.9A(Typ.)	0.38Ω(typ.)	80MHz

Operating temp. range: -40 to 85°C

Class of Magnetic Shield: Ferrite Core

For reflow soldering only

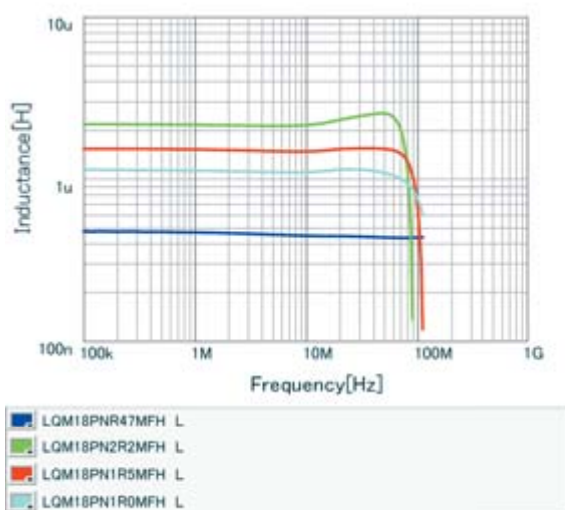
*Isat: Rated Current based on Inductance change

*Itemp: Rated Current based on Temperature rise

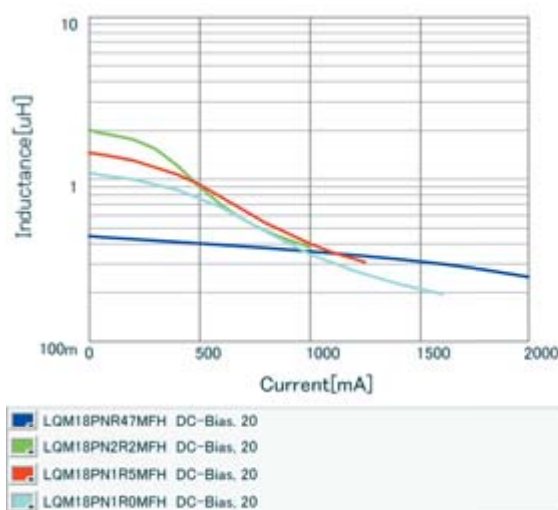
*S.R.F.: Self-Resonant Frequency

When rated current is applied to the products, inductance will be within ±30% of initial inductance value range. When rated current is applied to the products, the temperature rise caused by self-generated heat shall be limited to 40°C max. Keep the temperature (ambient temperature plus self-generation of heat) under 125°C.

Inductance-Frequency Characteristics (Typ.)



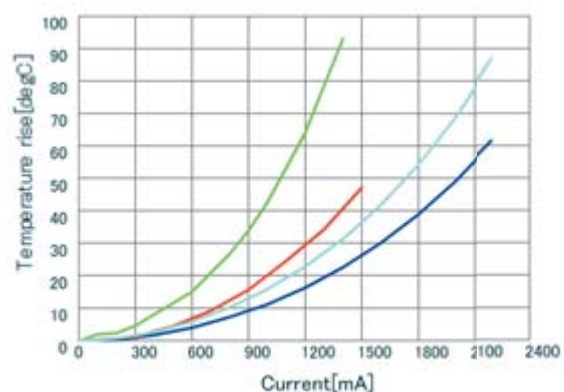
Inductance-Current Characteristics (Typ.)



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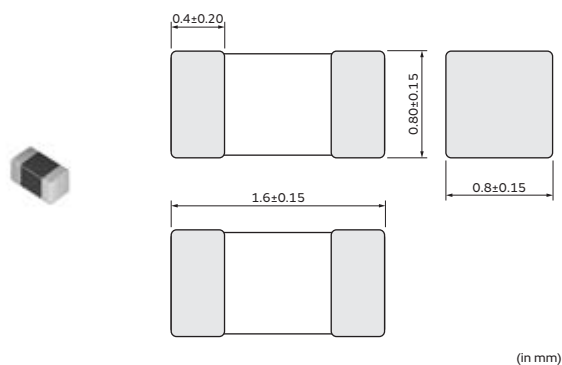
Temperature Rise Characteristics (Typ.)



Inductors for Power Lines

LQM18PN_FR Series 0603 (1608) inch (mm)

Appearance/Dimensions



Packaging

Code	Packaging	Minimum Quantity
L	ø180mm Embossed Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

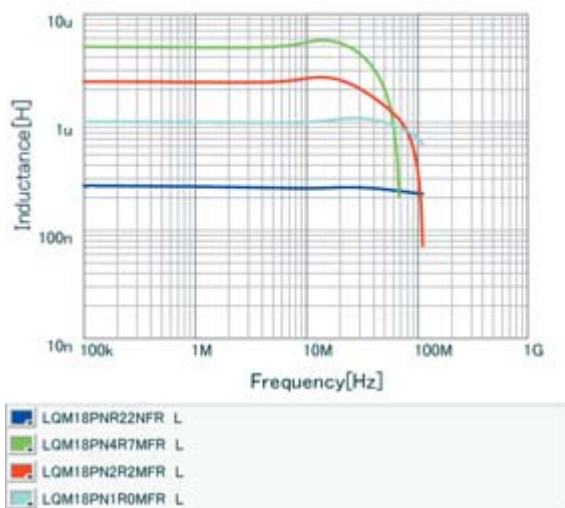
Part Number	Inductance	Inductance Test Frequency	Rated Current	DC Resistance	S.R.F.* (min.)
LQM18PNR22NFR□	0.22μH ±30%	1MHz	1250mA	0.11Ω±25%	100MHz
LQM18PNR47NFR□	0.47μH ±30%	1MHz	1100mA	0.15Ω±25%	100MHz
LQM18PN1R0MFR□	1.0μH ±20%	1MHz	950mA	0.20Ω±25%	100MHz
LQM18PN1R5MFR□	1.5μH ±20%	1MHz	800mA	0.23Ω±25%	100MHz
LQM18PN2R2MFR□	2.2μH ±20%	1MHz	750mA	0.30Ω±25%	70MHz
LQM18PN3R3MFR□	3.3μH ±20%	1MHz	700mA	0.35Ω±25%	60MHz
LQM18PN4R7MFR□	4.7μH ±20%	1MHz	620mA	0.44Ω±25%	40MHz

Operating temp. range: -40 to 85°C

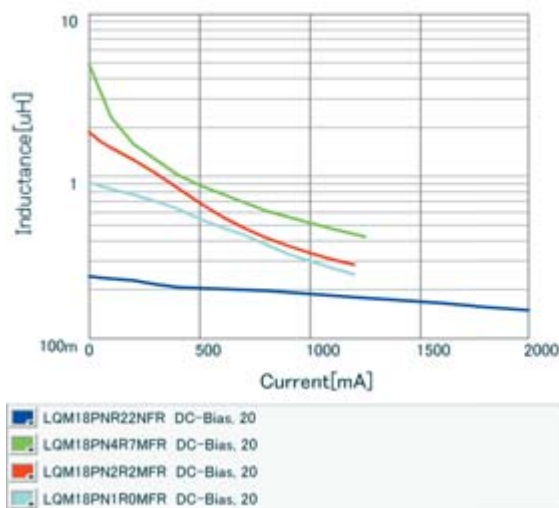
Class of Magnetic Shield: Ferrite Core

*S.R.F.: Self-Resonant Frequency

Inductance-Frequency Characteristics (Typ.)



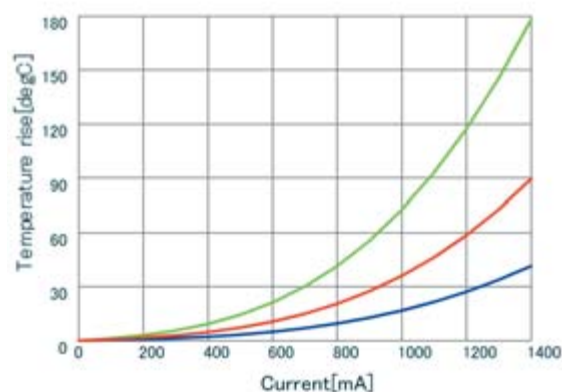
Inductance-Current Characteristics (Typ.)



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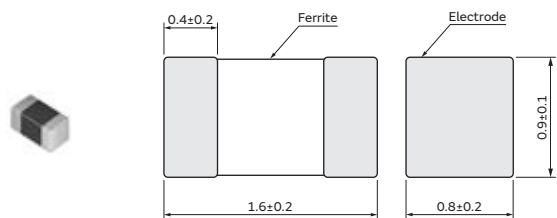
Temperature Rise Characteristics (Typ.)



Inductors for Power Lines

LQM18PN_GH Series 0603 (1608) inch (mm)

Appearance/Dimensions



(in mm)

Packaging

Code	Packaging	Minimum Quantity
D	ø180mm Paper Taping	4000
B	Packing in Bulk	1000

Rated Value (□: packaging code)

Part Number	Inductance	Inductance Test Frequency	Rated Current (Isat)*	Rated Current (Itemp)*	DC Resistance	S.R.F.* (min.)
LQM18PN1R0MGH□	1.0μH ±20%	1MHz	0.8A(Max.) / 0.9A(Typ.)	1.05A(Max.) / 1.15A(Typ.)	0.2Ω(typ.)	100MHz
LQM18PN2R2MGH□	2.2μH ±20%	1MHz	0.25A(Max.) / 0.35A(Typ.)	1.05A(Max.) / 1.15A(Typ.)	0.2Ω(typ.)	70MHz
LQM18PN3R3MGH□	3.3μH ±20%	1MHz	0.15A(Max.) / 0.2A(Typ.)	1.05A(Max.) / 1.15A(Typ.)	0.2Ω(typ.)	30MHz

Operating temp. range: -40 to 85°C

Class of Magnetic Shield: Ferrite Core

For reflow soldering only

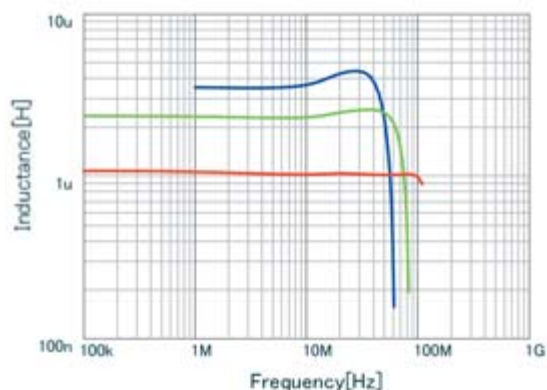
*Isat: Rated Current based on Inductance change

*Itemp: Rated Current based on Temperature rise

*S.R.F.: Self-Resonant Frequency

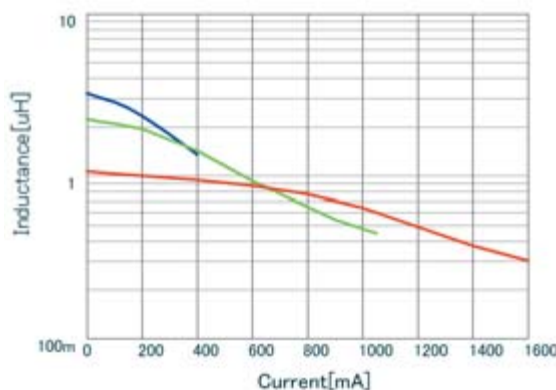
When rated current is applied to the products, inductance will be within ±30% of initial inductance value. When rated current is applied to the products, the temperature rise caused by self-generated heat shall be limited to 40°C max. Keep the temperature (ambient temperature plus self-generation of heat) under 125°C.

Inductance-Frequency Characteristics (Typ.)



LQM18PN3R3MGH L
LQM18PN2R2MGH L
LQM18PN1R0MGH L

Inductance-Current Characteristics (Typ.)

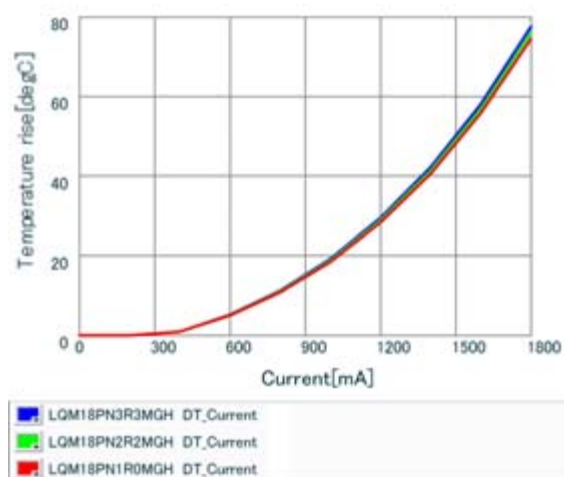


LQM18PN3R3MGH DC-Bias, 20
LQM18PN2R2MGH DC-Bias, 20
LQM18PN1R0MGH DC-Bias, 20

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Temperature Rise Characteristics (Typ.)



Inductors for Power Lines ⚠️Caution/Notice

⚠️Caution

Rating

1. About the Rated Current

Do not use products beyond the rated current as this may create excessive heat and deteriorate the insulation resistance.

2. About Excessive Surge Current

Surge current (pulse current or rush current) greater than the specified rated current applied to the product may cause a critical failure, such as an open circuit or burnout caused by excessive temperature rise.
Please contact us in advance if applying a surge current.

Notice

Storage and Operating Condition

<Operating Environment>

Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

<Storage Requirements>

1. Storage Period

The LQM series should be used within 6 months; the other products should be used within 12 months.
Check solderability if this period is exceeded.

2. Storage Conditions

- (1) Store products in a warehouse in compliance with the following conditions:
Temperature: -10 to +40°C.
Humidity: 15 to 85% (relative humidity)

Do not subject products to rapid changes in temperature and humidity.

Do not store them in a chemical atmosphere such as one containing sulfurous acid gas or alkaline gas.
This will prevent electrode oxidation, which causes poor solderability and possible corrosion of inductors.

- (2) Do not store products in bulk packaging to prevent collision among inductors, which causes core chipping and wire breakage.
- (3) Store products on pallets to protect from humidity, dust, etc.
- (4) Avoid heat shock, vibration, direct sunlight, etc.

Handling

This item is designed to have sufficient strength, but handle with care to avoid chipping or breaking its ceramic structure.

LQW_C series

- To prevent breaking the wire, avoid touching with sharp materials, such as tweezers or other materials such as the bristles of a cleaning brush, to the wire wound portion.
- To prevent breaking the core, avoid applying excessive mechanical shock to products mounted on the board.
- In some mounting machines, when picking up components, a support pin pushes the components up from the bottom of the base tape. In this case, please remove the support pin. The support pin may damage the components and break the wire.
- In rare cases, the laser recognition cannot recognize this component. Please contact us when you use laser recognition. (There is no problem with the permeation and reflection type.)
- The product temperature rises about 40°C maximum when the permissible current is applied to LQW15C/LQW18C. Please use caution regarding the temperature of the substrate and air around the part.

LQH_C/D/H/M/N/P series

- To prevent breaking the wire, avoid touching with sharp materials, such as tweezers or the bristles of a cleaning brush, to the wire wound portion of this product.
- To prevent breaking the core, avoid applying excessive mechanical shock to products mounted on the board.
- Temperature may rise up to max. 40°C when applying the rated current to Inductors for Power Lines. Use caution regarding the temperature rating of the circuit board and components around the chip Inductors.

LQM series

- There is the possibility that magnetism may change the inductance value. Do not use a magnet or tweezers with magnetism when handling chip inductors. (The tip of the tweezers should be molded with resin or pottery.)
- When the excessive current over rated current is applied, it may cause the inductance value to change due to magnetism.

<Transportation>

Do not apply excessive vibration or mechanical shock to products.

Continued on the following page. ↗

Inductors for Power Lines ⚠Caution/Notice

Continued from the preceding page. ↘

<Resin Coating>

When coating products with resin, the relatively high resin curing stress may change inductance values.

For exterior coating, select resin carefully so that electrical and mechanical performance of the product is not affected. Prior to use, please evaluate reliability with the product mounted in your application set.

(LQW, LQH series)

An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating conditions, etc. Some resins containing impurities or chloride may possibly generate chlorine by hydrolysis under some operating conditions, causing corrosion of the inductor wire and leading to an open circuit.

<Rated Current>

(LQH2HP_GR/JR, LQH2MPN_GR, LQH3NP_GR/JR/ME, LQH44P_GR, LQH5BPN_38 Series)

When rated current is applied to the products, Inductance will be within $\pm 30\%$ of specified inductance value range.

(Other LQH_P Series except for LQH2HP_G0 Series)

When rated current is applied to the products, Inductance will be within $\pm 30\%$ of nominal inductance value.

• Rated Current Based on Temperature Rise

For LQH2MC series and LQH_P series, rated current is set to keep the temperature rise caused by self heating 40°C or less.

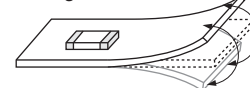
For other Inductors for Power Lines, please refer to individual specifications.

<Handling of a Substrate>

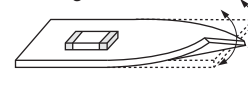
After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting the substrate when cropping the substrate, inserting and removing a connector from the substrate, or tightening a screw to the substrate.

Excessive mechanical stress may cause cracking in the Product.

Bending



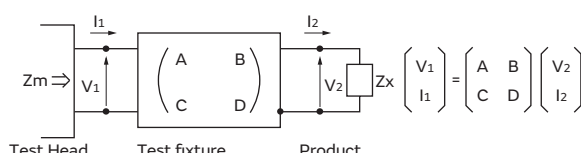
Twisting



Measuring Method

Measuring Method of Inductance/Q

1. Residual elements and stray elements of test fixtures can be described by F-parameter as shown in the following:



2. The impedance of chip inductors (chip coils) Z_x and measured value Z_m can be described by input/output current/voltage.

$$Z_m = \frac{V_1}{I_1}, \quad Z_x = \frac{V_2}{I_2}$$

3. Thus, the relation between Z_x and Z_m is shown in the following:

$$Z_x = \alpha \frac{Z_m - \beta}{1 - Z_m \Gamma}$$

$$\text{where, } \alpha = D / A = 1$$

$$\beta = B / D = Z_{sm} - (1 - Y_{om} Z_{sm}) Z_{ss}$$

$$\Gamma = C / A = Y_{om}$$

(Z_{sm} : measured impedance of short chip
 Z_{ss} : residual impedance of short chip*
 Y_{om} : measured admittance when opening the fixture)

*Residual impedance of short chip

Residual Impedance	Series
0.556nH	LQW15C
0.771nH	LQW18C

4. L_x and Q_x should be calculated with the following equation.

$$L_x = \frac{\text{Im}(Z_x)}{2\pi f}, \quad Q_x = \frac{\text{Im}(Z_x)}{\text{Re}(Z_x)}$$

L_x : Inductance of chip Inductors (chip coils)
 Q_x : Q of chip Inductors (chip coils)
 f : Measuring frequency

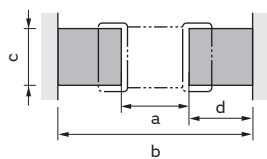
Inductors for Power Lines Soldering and Mounting

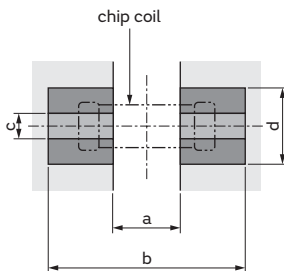
1. Standard Land Pattern Dimensions

A high Q value is achieved when the PCB electrode land pattern is designed so that it does not project beyond the

chip Inductor's (chip coil's) electrode.

Land Pattern + Solder Resist Land Pattern Solder Resist
(in mm)

Series	Standard Land Dimensions						
LQM18F/18P (Except for LQM18P_CH/FH/GH) LQM21D/21F/21P (Except for LQM21P_CA/CH/ EH/GH) LQM2MP (Except for LQM2MP_GH) LQM2HP (Except for LQM2HP_CH/ EH/GH/JH) LQM31P LQM32P LQH2MC LQH31C LQH32P LQH44P_P0/J0/GR LQH5BP LQH55D/66S LQW15CN_00 LQW15C_10 LQW18C		Part Number		a	b	c	d
		LQM18F/18P	Flow	0.7	2.2-2.6 1.8-2.0	0.7	-
			Reflow				
		LQM21D/21F/21P		1.2	3.0-4.0	1.0	-
		LQM2MP		0.8	2.4	1.8	-
		LQM2HP		1.6	3.0	1.5	-
		LQM31P		2.0	4.2-5.2	1.2	-
		LQM32P		1.9	3.6	2.7	-
		LQH2MC		0.8	2.6	1.0	-
		LQH31C		1.0	4.5	1.5	-
		LQH32P		1.3	3.8	2.0	-
		LQH44P_P0		1.3	4.4	3.0	-
		LQH44P_J0/GR		1.5	4.4	2.7	-
		LQH5BP		1.8	5.5	4.1	1.85
		LQH55D/66S		2.0	8.0	3.5	-
		LQW15CN_00		0.4	1.4	0.6	-
		LQW15C_10		0.4	1.4	0.66	-
		LQW18C		0.7	2.2	1.0	-

LQM18P_CH/FH/GH LQM21P_CA/CH/EH/GH LQM2MP_GH LQM2HP_CH/EH/GH/JH		Part Number	Rated Current (A)	a	b	c	Land Pad Thickness and Dimension d		
							18μm	35μm	70μm
		LQM18P_CH	0-0.7	0.7	1.8-2.0	0.7	0.7	0.7	0.7
			0.7-1.05				1.1	0.7	0.7
		LQM18P_FH	0-0.7	0.7	1.8-2.0	0.7	0.7	0.7	0.7
			0.7-1.7				1.4	0.7	0.7
		LQM18P_GH	0-0.7	0.7	1.8-2.0	0.7	0.7	0.7	0.7
			0.7-1.15				1.2	0.7	0.7
		LQM21P_CA	-	1.2	3.0-4.0	1.0	1.3	1.0	1.0
		LQM21P_CH	0-1.0	1.2	3.0-4.0	1.0	1.0	1.0	1.0
			1.0-1.5				1.5	1.0	1.0
			1.5-				2.0	1.5	1.0
		LQM21P_EH LQM21P_GH	0-1.0	1.2	3.0-4.0	1.0	1.0	1.0	1.0
			1.0-1.5				1.5	1.0	1.0
			1.5-3.1				3.0	1.5	1.0
		LQM2MP_GH	0-1.5	0.8	2.4	1.8	1.8	1.8	1.8
			1.5-2.5				2.4	1.8	1.8
			2.5-5.0				5.0	2.4	1.8
		LQM2HP_CH	0-1.5	1.6	3.0	1.5	1.5	1.5	1.5
			1.5-3.0				3.0	1.5	1.5
		LQM2HP_EH	0-1.5	1.6	3.0	1.5	1.5	1.5	1.5
			1.5-3.0				3.0	1.5	1.5
			3.0-5.0				5.0	3.0	1.5
		LQM2HP_GH	0-1.5	1.6	3.0	1.5	1.5	1.5	1.5
			1.5-2.6				2.4	1.5	1.5
			3.3-4.2				4.4	3.6	2.4
		LQM2HP_JH	0-1.6	1.6	3.0	1.5	1.5	1.5	1.5
			1.6-2.4				2.4	1.5	1.5
2.4-3.5	3.6		2.4				1.5		

Attention should be paid to potential magnetic coupling effects when using the Inductor (coil) as a resonator.

Continued on the following page. ➤

Inductors for Power Lines Soldering and Mounting

Continued from the preceding page. ↘

Land Pattern + Solder Resist Land Pattern Solder Resist
(in mm)

Series	Standard Land Dimensions
LQH2HP (Except for LQH2HP_GR)	
LQH2HP_GR/JR	
LQH32C/D	
LQH3NP (Except for LQH3NP_JR/GR/ME)	
LQH3NP_JR/GR/ME	
LQH43C LQH43P	

Attention should be paid to potential magnetic coupling effects when using the Inductor (coil) as a resonator.

2. Standard Soldering Conditions

(1) Soldering method

Chip Inductors (Chip coils) can be flow or reflow soldered.

Please contact Murata regarding other soldering methods.

For LQH2MC/2MP/2HP/3NP/32D/32P/43PB/44P/5BP/55D/66S, LQM2MP_DH/EH/GH/2HP_CH/EH/GH/JH/18P_CH/DH/FH/GH/21P_CA/CH/EH/GH/32P, LQW15C/18C series, please use reflow soldering.

Solder: Use Sn-3.0Ag-0.5Cu solder.

Flux: Use rosin-based flux, but not strongly acidic flux (with chlorine content exceeding 0.2wt%).

Do not use water-soluble flux.

The flux used for the LQW15C/18C series should be a rosin-based flux that includes a middle activator equivalent to 0.06wt% to 0.1wt% chlorine.

For additional mounting methods, please contact Murata.

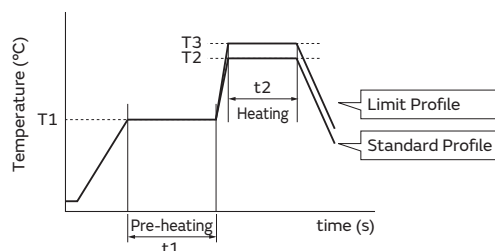
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Inductors for Power Lines Soldering and Mounting

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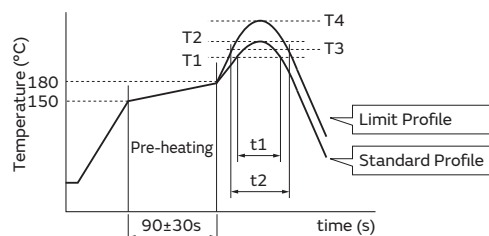
(2) Soldering profile

●Flow Soldering profile (Sn-3.0Ag-0.5Cu solder)



Series	Pre-heating		Standard Profile			Limit Profile		
	Temp. (T1)	Time. (t1)	Temp. (T2)	Time. (t2)	Cycle of flow	Temp. (T3)	Time. (t2)	Cycle of flow
LQM18F/18P (Except for CH/DH/FH/GH) LQM21D/21F/21P (Except for CA/CH/EH/GH) LQM2MP (Except for DH/EH/GH) LQM2HP (Except for CH/EH/GH/JH) LQM31P LQH31C	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	2 times max.
LQH32C LQH43C/43PN	150°C	60s min.	250°C	4 to 6s	2 times max.	265±3°C	5s max.	1 time

●Reflow Soldering profile (Sn-3.0Ag-0.5Cu solder)



Series	Standard Profile				Limit Profile			
	Heating		Peak temperature (T2)	Cycle of reflow	Heating		Peak temperature (T4)	Cycle of reflow
	Temp. (T1)	Time. (t1)			Temp. (T3)	Time. (t2)		
LQM18F/18P LQM21D/21F/21P/2MP/2HP LQM31P/32P LQH2MC, LQH2HP LQH31C LQH32D_23 (Except for 391/471/561) LQH32D_53 LQH3NP/32P/43P/44P/5BP LQW15C/18C	220°C	30 to 60s	245±3°C	2 times max.	230°C	60s max.	260°C/10s	2 times max.
LQH32C LQH32D_23 (391/471/561 only) LQH43C LQH55D, LQH66S	220°C	30 to 60s	245±3°C	2 times max.	230°C	60s max.	260°C/10s	1 time

Continued on the following page. ↗

Inductors for Power Lines Soldering and Mounting

Continued from the preceding page. ↘

(3) Reworking with a Soldering Iron

Preheating at 150°C for 1 minute is required. Do not directly touch the ceramic element with the tip of the soldering iron. The reworking soldering conditions are as follows:

Soldering iron power output: 80W max.

Temperature of soldering iron tip: 350°C

Diameter of soldering iron end: 3.0mm max.

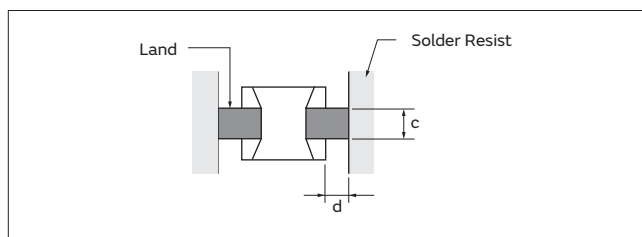
Soldering time: within 3 s

Please keep the fix time with the soldering iron within 2 times.

3. Mounting Instructions

(1) Land Pattern Dimensions

Large lands reduce the Q of the mounted chip. Also, large protruding land areas (bordered by lines having the dimensions "c" and "d" shown) cause floating and electrode leaching.



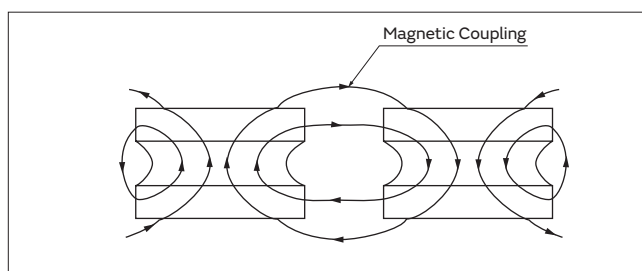
(2) Land Pattern Designing (LQH series, LQW series)

Please follow the recommended patterns.

Otherwise, their performance, which includes electrical performance or solderability, may be affected, or result in "position shift" in the soldering process.

(3) Magnetic Coupling

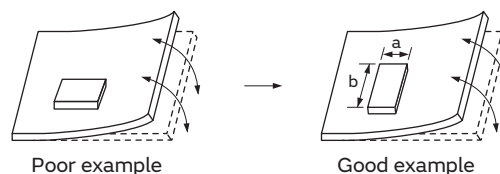
Since some chip inductors (chip coils) are constructed like an open magnetic circuit, narrow spacing between inductors (coils) may cause magnetic coupling. LQM, LQH66S, and LQH_P series have a magnetically shielded structure. The structure makes their coupling coefficient smaller than that of conventional chip inductors (chip coils).



(4) PCB Warping

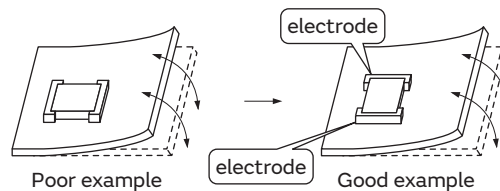
The PCB should be designed so that products are not subjected to mechanical stress caused by warping of the board.

Products should be located in a sideways direction (Length: $a < b$) to mechanical stress.



Except LQH3NP/44P/5BP

The electrode part of the product should be located as in the figure to avoid mechanical stress.



LQH3NP/44P/5BP

Continued on the following page. ↗

Inductors for Power Lines Soldering and Mounting

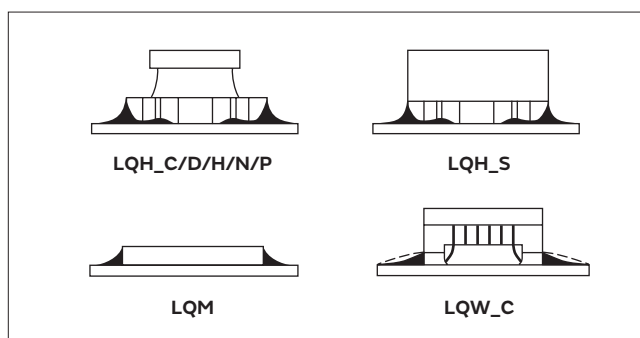
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(5) Amount of Solder Paste

Excessive solder causes electrode corrosion, while insufficient solder causes low electrode bonding strength. Adjust the amount of solder paste as shown on the right so that the correct amount is applied.

Guideline of solder paste thickness

- LQW15C: 50 to 100μm
- LQM, LQW18C, LQH2MC/2HP, LQH3NP/32P, LQH43PB/LQH44P/5BP: 100 to 150μm
- LQH31C/32C, LQH43C/43PN, LQH55D, LQH66S: 200 to 300μm



4. Cleaning

The following conditions should be observed when cleaning chip inductors (chip coils):

- (1) Cleaning Temperature: 60°C max. (40°C max. for alcohol cleaning agents)
- (2) Ultrasonic
 - Output: 20W/l max.
 - Duration: 5 minutes max.
 - Frequency: 28 to 40kHz
 - Care should be taken not to cause resonance of the PCB and mounted products.

(3) Cleaning agent

The following cleaning agents have been tested on individual components. Evaluation in complete assembly should be done prior to production.

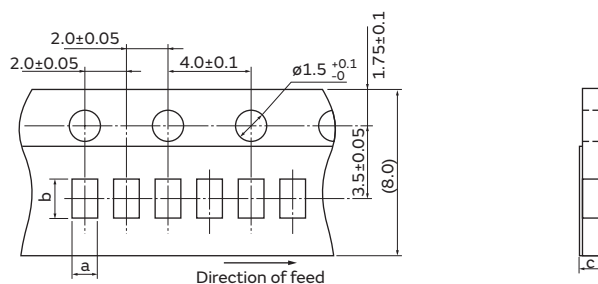
- (a) Alcohol cleaning agents
 - Isopropyl alcohol (IPA)
- (b) Aqueous cleaning agents
 - Pine Alpha ST-100S
 - LQH66S series: Aqueous agents should not be used because they may cause quality deterioration or damage to appearance.

- (4) Ensure that flux residue is completely removed. Component should be thoroughly dried after aqueous agents have been removed with deionized water.

For additional cleaning methods, please contact Murata.

Inductors for Power Lines Packaging

Minimum Quantity and 8mm Width Taping Dimensions



Paper Tape

Part Number	Dimensions		Total Thickness of Tape	Packaging Code (Minimum Qty. (pcs.))		
	a	b		ø180mm reel	ø330mm reel	Bulk
LQW15CN_00	0.64: 70nH to 200nH	1.18	0.8 max.	D (10000)	—	B (500)
	0.66: 18nH to 48nH					
LQW15C_10	0.69	1.18	0.8 max.	D (10000)	—	B (500)

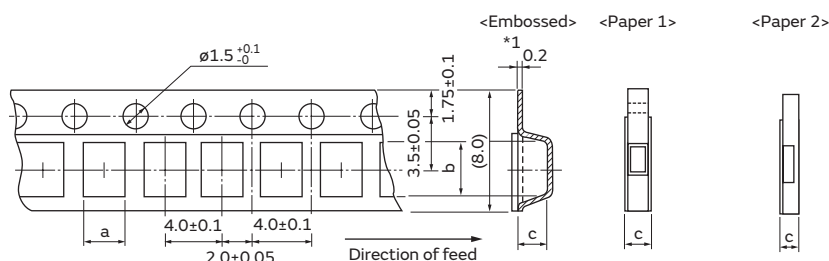
(in mm)

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Inductors for Power Lines Packaging

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Minimum Quantity and 8mm Width Taping Dimensions



The dimension of the cavity of embossed tape is measured at the bottom side.

*1: 0.25 LQM2HP/2MP/31P_00, LQH2, LQM21P

Paper Tape 1

Part Number	Dimensions		Total Thickness of Tape	Packaging Code (Minimum Qty. (pcs.))		
	a	b		$\phi 180$ mm reel	$\phi 330$ mm reel	Bulk
LQM21D (1 to 10 μ H)	1.45	2.25	1.1 max.	D (4000)	J (10000)	B (1000)
LQM21F (1 to 2.2 μ H)	1.45	2.25	1.1 max.	D (4000)	J (10000)	B (1000)
LQM21P_C0	1.45	2.25	0.8 max.	D (4000)	—	B (1000)
LQM21P_CA	1.45	1.45	0.9 max.	D (3000)	—	B (1000)
LQM21P_CH	1.45	2.25	0.7 max.	D (3000)	—	B (1000)
LQM21P_EH	1.45	2.25	1.0 max.	D (3000)	—	B (1000)
LQM21P_G	1.45	2.25	1.1 max.	D (4000)	—	B (1000)
LQM18F	1.05	1.85	1.1 max.	D (4000)	J (10000)	B (1000)
LQM18P_D0	1.05	1.85	0.85 max.	D (4000)	—	B (1000)
LQM18P_CH	1.1	1.9	0.95 max.	D (4000)	—	B (1000)
LQM18P_GH	1.1	1.9	1.25 max.	D (4000)	—	B (1000)
LQW18C	1.0	1.8	1.1 max.	D (4000)	—	B (500)

Paper Tape 2

Part Number	Dimensions		Total Thickness of Tape	Packaging Code (Minimum Qty. (pcs.))		
	a	b		$\phi 180$ mm reel	$\phi 330$ mm reel	Bulk
LQM18PN_DH	1.05	1.85	1.05 max.	D (4000)	—	B (1000)

(in mm)

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Minimum Quantity and 8mm Width Taping Dimensions

Embossed Tape

Part Number	Dimensions		Depth of Cavity	Packaging Code (Minimum Qty. (pcs.))		
	a	b	c	ø180mm reel	ø330mm reel	Bulk
LQM18P_B0	1.0	1.8	0.50	L (4000)	—	B (1000)
LQM18P_C0	1.0	1.8	0.60	L (4000)	—	B (1000)
LQM18P_F0	1.0	1.8	1.0	L (4000)	—	B (1000)
LQM21D (22 to 47μH)	1.45	2.25	1.3	L (3000)	K (10000)	B (1000)
LQM21F (4.7 to 47μH)	1.45	2.25	1.3	L (3000)	K (10000)	B (1000)
LQM21P_GH	1.45	2.25	1.05	L (3000)	—	B (1000)
LQM2HP_CH	2.3	2.8	0.6	L (3000)	—	B (1000)
LQM2HP_J0/JC	2.25	2.75	1.3	L (3000)	—	B (1000)
LQM2HP_JH	2.25	2.75	1.3	L (3000)	—	—
LQM2HP_G	2.3	2.8	1.1	L (3000)	—	B (1000)
LQM2HP_GH	2.3	2.8	1.1	L (3000)	—	—
LQM2HP_E0/EH	2.3	2.8	0.9	L (3000)	—	B (1000)
LQM2MP_DH/EH	1.9	2.4	0.9	L (3000)	—	B (1000)
LQM2MP_G0	1.85	2.25	1.1	L (3000)	—	B (1000)
LQM2MP_GH	1.9	2.4	1.1	L (3000)	—	—
LQM31P_00	1.9	3.5	1.05	L (3000)	—	B (1000)
LQM31P_C0	1.9	3.5	0.75	L (4000)	—	B (1000)
LQM32P_G0/GC	2.9	3.6	1.15	L (3000)	—	B (1000)
LQH31C	1.9	3.6	2.0	L (2000)	K (7500)	—
LQH32C_33/_23, LQH32D_23	2.9	3.6	2.1	L (2000)	K (7500)	—
LQH32C_53, LQH32D_53	2.9	3.6	1.7	L (2000)	K (7500)	—
LQH32P	2.9	3.6	1.7	L (2000)	K (7500)	—
LQH2MC_02	1.9	2.3	1.05	L (3000)	—	B (100)
LQH2MC_52	1.9	2.3	0.8	L (3000)	—	B (100)

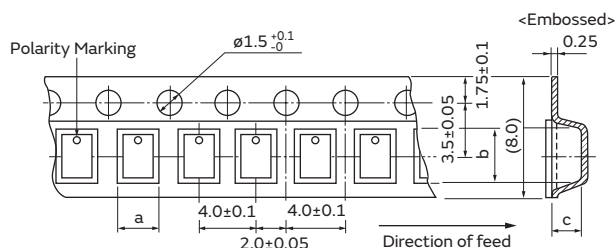
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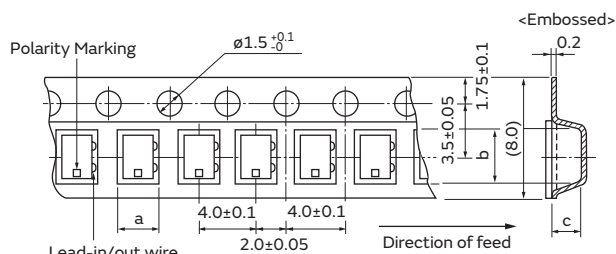
Minimum Quantity and 8mm Width Taping Dimensions



The dimension of the cavity is measured at the bottom side.

Embossed Tape

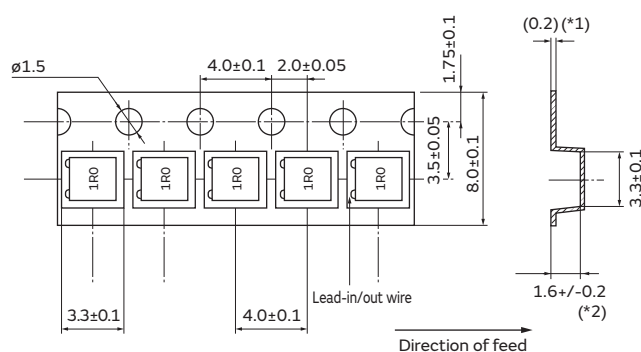
Part Number	Dimensions		Depth of Cavity	Packaging Code (Minimum Qty. (pcs.))		
	a	b		$\phi 180$ mm reel	$\phi 330$ mm reel	Bulk
LQH2HP_GR	2.3	2.8	1.1	L (3000)	—	—
LQH2HP_JR	2.3	2.8	1.3	L (2000)	—	—



The dimension of the cavity is measured at the bottom side.

Embossed Tape

Part Number	Dimensions		Depth of Cavity	Packaging Code (Minimum Qty. (pcs.))		
	a	b		$\phi 180$ mm reel	$\phi 330$ mm reel	Bulk
LQH3NP_MR	3.3	3.3	1.6	E (2000)	F (8000)	—



The dimension of the cavity is measured at the bottom side.

*1 0.3 LQH3NP_GR
*2 1.1 ± 0.1 LQH3NP_GR

Embossed Tape

Part Number	Dimensions		Depth of Cavity	Packaging Code (Minimum Qty. (pcs.))		
	a	b		$\phi 180$ mm reel	$\phi 330$ mm reel	Bulk
LQH3NP_GR	3.3	3.3	1.1	L (3000)	—	—
LQH3NP_JR	3.3	3.3	1.6	L (2000)	—	—
LQH3NP_ME	3.3	3.3	1.6	L (2000)	—	—

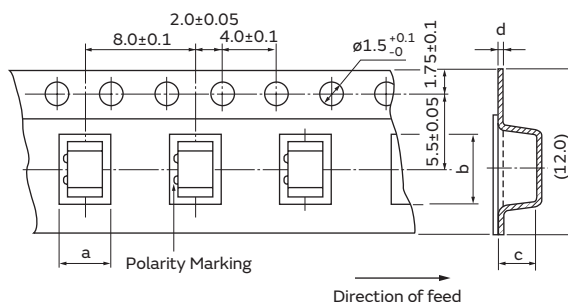
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Inductors for Power Lines Packaging

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Minimum Quantity and 12mm Width Embossed Taping Dimensions



The dimension of the cavity of embossed tape is measured at the bottom side.

Embossed Tape

Part Number	Dimensions (*c: Depth of Cavity)				Packaging Code (Minimum Qty. (pcs.))		
	a	b	c	d	ø180mm reel	ø330mm reel	Bulk
LQH43C	3.6	4.9	2.7	0.3	L (500)	—	—
LQH43P	3.6	4.9	2.7	0.3	L (500)	K (2500)	—
LQH44P_J0/GR	4.3	4.3	1.4	0.3	L (1000)	K (3500)	—
LQH44P_P0	4.3	4.3	1.9	0.3	L (1000)	K (3500)	—
LQH5BP_38	5.3	5.3	4.2	0.4	L (400)	K (1500)	—
LQH5BP_T0	5.3	5.3	2.4	0.3	L (500)	K (3000)	—
LQH55D	5.4	6.1	5.0	0.4	L (350)	K (1500)	—
LQH66S	6.7	6.7	5.6	0.4	L (350)	K (1500)	—

(in mm)